

REMARKS

Applicants thank the Examiner, Mr. Ratcliffe for his courtesy and assistance in advancing the prosecution of this application during an interview conducted June 10, 2008. As indicated in the Interview Summary, following the discussion, it was concluded that the claims as amended herein distinguish over the cited McGill et al patent. Since both independent Claims 21 and 33 contain all of the distinguishing features discussed during the interview, Applicants believe that this application is now in condition for allowance.

Claims 21, 22, 24-29 and 32-36 have been rejected under 35 U.S.C. §102(b) as anticipated by McGill et al (U.S. Patent No. 6,313,908), while Claims 23, 31 and 38-40 have been rejected under 35 U.S.C. §103(a) as unpatentable over McGill et al. In addition, Claim 30 has been rejected as unpatentable over McGill et al in view of Caldwell et al (U.S. Patent No. 6,894,768), and Claim 37 has been rejected as unpatentable over McGill et al in view of Korb (U.S. Patent No. 5,216,477). However, for the reasons set forth hereinafter, Applicants respectfully submit that all claims of record in this application distinguish over the cited references, whether considered separately or in combination.

The McGill et al patent discloses, among other things, a lidar system to measure wind velocities by aerosol and/or molecular backscatter. It is

similar to the present invention to the extent that a laser transmitter 70 generates an outgoing laser beam 90 and detects a backscatter light return signal 80 which is combined with a portion of the outgoing signal to generate an interference pattern, which is directed onto interferometers 92, 93, as illustrated in Figure 6a. The manner in which the system in McGill et al uses the output from the interferometer, however, differs fundamentally from that of the present invention.

In particular, Claim 21 of the present application specifies that the interferogram generated by the interferometer is imaged onto a photodetector. In addition, Claim 21 further specifies that the interferogram detected by the photodetector is then compared "with a family of reference interferogram patterns which were previously determined for defined atmospheric parameters, which reference interferogram patterns comprised at least one of different densities and temperatures of the atmosphere". Finally, Claim 21 further provides that the Doppler shift is determined as a measure of the wind velocity "based on the comparison of the interferogram detected by the photodetector with the family of different reference interferogram patterns". Claim 33 is an apparatus claim which is similarly limited.

By way of contrast, in McGill et al, the interferogram is not in fact imaged onto a photodetector as recited in Claim 21. Rather, it is focused on a

“holographic optical element” that “converts an incident spectral distribution [in other words, the interference pattern] to image points”. (See Column 2, lines 42-44.) The image points (referred to as “point images” 25 at Column 7, lines 33-34) generated by the holographic optical element are then focused onto a detector, as noted at Column 2, lines 56-58. Thereafter, the Doppler shift is determined by comparing the spectral shape of the return signal with that of the outgoing signal, as stated at Column 7, lines 34-36.

Thus, in McGill et al, the interferogram generated by the interferometer is not focused onto a photodetector as recited in Claim 21. Moreover, in McGill et al, the interferogram itself is not compared at all. Rather, as noted previously, it is focused onto the holographic optical element which “converts an incident spectral distribution to image points”. (Column 2, lines 42-43.) (The holographic optical element includes areas, each of which comprises a recorded hologram which acts as a separate lens to focus the distribution in its area to an image point. The image points in turn can form a straight line. (See Column 2, lines 42-51.) The image points formed in this manner are then focused onto a photodetector, such as a CCD array. (See Column 2, lines 52-61.) Thus, the light which is focused onto the photodetector is not the interferogram, but rather, a series of points generated by the holographic optical element.

Moreover, McGill et al also contains no discussion which teaches or suggests the storage of a family of previously determined reference interferogram patterns. Indeed, such reference interferogram patterns would have no utility in the McGill et al apparatus, given the manner of operation described above.

Finally, in McGill et al, not the interferogram, but the spectral shape of the return signal 80 (as determined by the process described above, in which the interferogram is directed onto a holographic optical element to generate a sequence of points), is compared with that of the outgoing laser beam 90, as illustrated, for example, in Figure 6b, to measure the Doppler shift.

The present invention therefore discloses and claims a lidar-based system for detecting wind speed which is significantly simpler than that in McGill et al, by preparing and storing in a memory a family of reference interferogram patterns which have been previously determined based on measurements made with known parameters. The interferogram pattern as detected by the photodetector is then compared directly with the reference interferogram patterns previously determined, in order to select that which is closest to the detected pattern. In this manner, the wind speed can be determined directly from the wind speed which corresponds to the selected pattern.

Accordingly, for the reasons set forth hereinabove, Applicants respectfully submit that Claims 21 and 33 distinguish over the McGill et al patent. The Caldwell et al patent, on the other hand, has been cited only in respect of Claim 30, as showing a lidar system that is mounted on board a moving system, while the Korb reference has been cited only in respect of Claim 37, as teaching the use of a lidar system that includes a Fizeau interferometer. Neither of the latter references teaches or suggests those features of the invention, discussed previously, which are missing in the McGill et al patent. Accordingly, Applicants respectfully submit that all claims currently of record in this application distinguish over the cited references.


In light of the foregoing remarks, this application should be in consideration for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and

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Respectfully submitted,



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